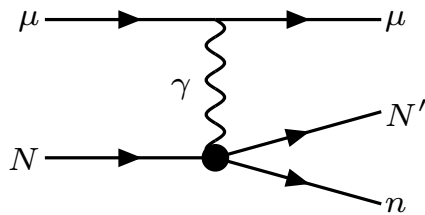# LBL-group meeting

neutrino.lbl.gov/∼snoman/currat/talks/

Charles Currat
LBNL

March 9, 2004

❖ Update on the muon group activities

☞ "Stalling jobs" problem: fixed a bug (v. 4_0286/7) in photodisintegration process, submitted for next release (N. West) ✓

✍ Preparing a note on muon code in Snoman:
- ❖ processes (old and new)
- ❖ new features: flags, title files, example command file
- ❖ recommendations for running without ds breakdown

SNO/ANA/MUONS/00xx
Version 1.0
March 8, 2004

Muons in Snoman

Charles Currat, LBNL

Abstract

Number of additions and modifications to the code enhanced the description of muons generation in Snoman as of v. 4_0286. These modifications are reviewed along with common recommendations as how to use Snoman for higher energy particles.

1   Muons from cosmic rays

As shown on Figure 1 the energy spectrum of muons implemented in Snoman is quite hard in comparison to the standard solar neutrinos handling capabilities of the code.

2   Processes included in muon generation

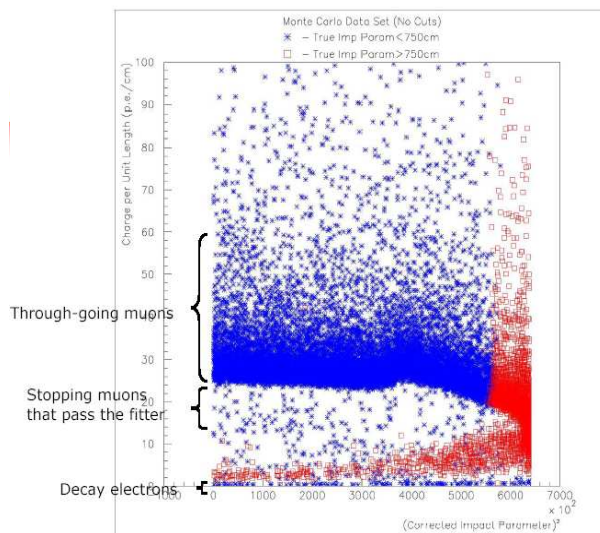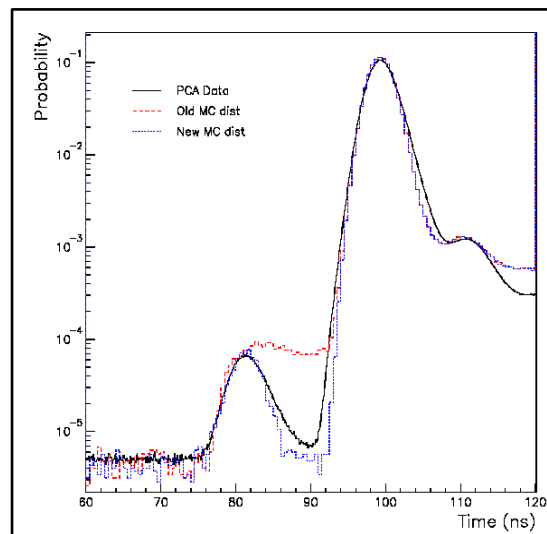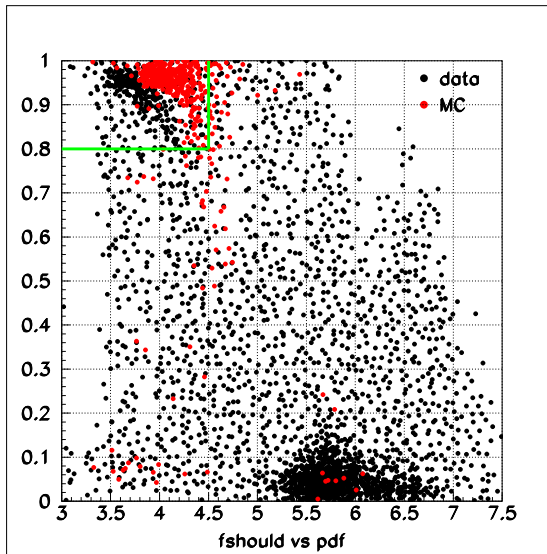A good number of processes describe the interactions of muons in Snoman in v. 4_0286.

- photodisintegration
- pair creation
- delta rays (knock off electrons)
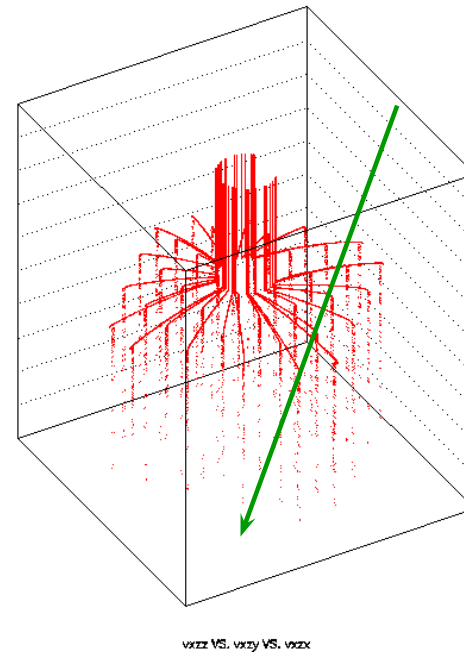
Two criteria used for characterization [N. Tagg, 2001]:

❖ $0 < F_{should} < 1$, topology based. Check if live PMT pattern compatible with direct light from fitted muon track

❖ *PDF* parameter, probability that PMTs time residuals (sum over *all* tubes) is typical of a muon's ⇨ PDF to be rebuilt since PMTs timing got revisited [T. Tsui]

❖ New suggestion: use some dE/dx variable (although not quite fitter independent)

❖ Multi-photon correction revisited

Need a sample of "golden" muons for MC tuning purpose (i.e. test beam data).
Any way that would allow us to tag/measure $\gtrsim 1$ muon/day is to be considered

vxzz VS. vxzy VS. vxzx

❖ tracking chambers ⇨ ultimately the best thing and definitely realistic, but timescale... probably nothing before late fall this year (and we need to work meantime)

❖ possibility to tag muons with NCDs (if not more) ⇨ should be possible in v. 4_0287, to be determined